Reading questions

What is the difference between recommended and absolute ratings?

- The absolute rating are the rated values in order to maintain an IC's life and reliability. The absolute maximum ratings are limiting values of operating and environmental conditions applicable to any electronic device of a specified type as defined by its published data. It should not be exceeded under the worst probable conditions. These values are chosen by the device manufacturer to provide acceptable serviceability of the device, taking no responsibility for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the device under consideration and of all other electronic devices in the equipment.

- The recommended ratings are values which ensure proper operation of a system. It is the generic operating parameters for a given electrical system. It is rating that the manufacturer specifies for a device to operate within

• **What is the maximum voltage you can apply to a pin on the SAM W25? What is the power supply voltage in that case?**

- VCC+0.30 = 3.6+0.3 = 3.9V (max). typical voltage = 3.3V
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- VCC (power supply for I/O) Power supply voltage in the max case is 3.63V

- VBAT (supply for internal regulator and WiFi) Power supply voltage in the max case is 5V

• **For the SAMW25, what is the difference between the VBATT & VDDIO pins?**
- I/O supply voltage (VCC) is applied to VDDIO and VDDIO_A

- VBAT is Battery supply voltage which is applied to VDD_BATT_PPA, VDD_BATT_PA, and VBATT_BUCK.

• **What voltage will you supply to these?**
- VDDIO pins will have min 2.7 V, typical 3.3V and Maximum 3.6 V

- VBATT pins will have min 3.0V, typical 3.6 V and Maximum 4.3V

• **How much current do you anticipate to be drawn in the highest current draw situation?**
- The max current is 13.5 mA
- With high drive pads 27 mA.
• **Why might you want to use separate voltage sources for VBATT & VDDIO?**

- The VBATT to provide a clean voltage source to the ATWINC WiFi board, as opposed to WiFi drawing power from VDDIO. The VDDIO voltage fluctuates based on load of the various sensors which are connected via GPIO pins.

- **How many reset lines are on the SAM W25? What does each do?**
  - RESET_N: System Reset. Low level on this pin resets the entire module.
    Wi-Fi Reset_n: Currently used only for Atmel debug. Not for customer use. Leave unconnected.

- **Given what you know about button debouncing & default pin states, what additional circuitry would you put on these reset pins? Note: include a physical button for manual resets.**

  - If you want to input a manual switch signal into a digital circuit you'll need to debounce the signal so a single press doesn't appear like multiple presses.
  - In devices a mechanical pushbutton switch often make and break contact several times when the button is first pushed. A debouncing circuit removes the resulting ripple signal and provides a clean transition at its output. The basic idea is to use a capacitor to filter out any quick changes in the switch signal.
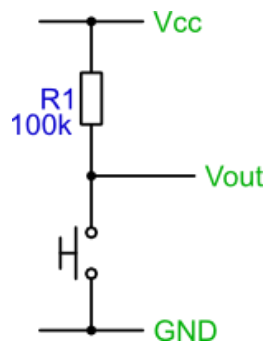
Simple switch pull-up circuit
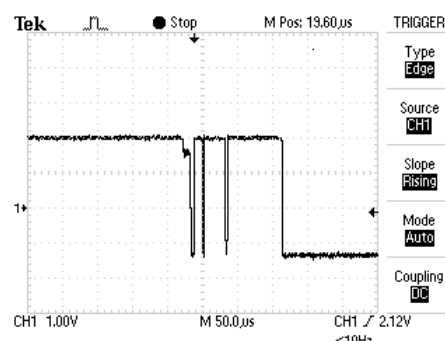
Switch bounce produced on switch press